

## ATMOSPHERIC ELECTRICITY.

*Thunder-storms.*—1st, Kan., Tenn., Ill., Ark., Tex.; 2nd, Ky., Ga., Ill., Ind., N. C., Tenn.; 3rd, Va., Md., Mass., Conn., Del., Fla., Ind., N. J., N. Y., Pa.; 4th, Mass.; 6th, Tex., Iowa, Mo., Ind., Mich., Ill., Kan., Ohio, Wis.; 7th, Minn., Miss., Pa., N. J., Va., R. I., Conn., Dak., N. Y., Kan., Md., Mass., W. Va.; 8th, Ind. T., Neb., Dak., Minn., Tex., Ill., Iowa, Kan., Mo., Wis.; 9th, Tex., Ala., La., Tenn., Ark., Del., Iowa, Miss., Mo.; 10th, Fla., Ala., Md., Mass., Pa.; 11th, Ind. T., Kan., Ala., W. Va., Tenn., Pa., Fla., Va., Md., Ga., Iowa, Ky., Mo., Neb., N. Y., Ohio, W. Va.; 12th, Ala., Iowa, Mo., Ohio, W. Va., Ky., Ill., Va., Pa., N. Y., N. J., Md., Del., Fla., Ga., Ind., N. C., S. C., Tenn.; 13th, Va., Pa., N. J., N. Y., Fla., Ind., Md., Ohio; 14th, Pa., N. J.; 15th, Tex.; 16th, Mich., Ohio, Tex.; 17th, Fla.; 18th, N. M., Cal.; 19th, Kan., Dak.; 20th, Kan., Neb., Iowa, Dak.; 21st, Ind. T., Nev., Dak., Ill., Iowa; 22nd, Tex.; 23rd, Mich., Ohio, Ind., Ill.; 24th, Cal., W. Va., Ohio, Pa., Va., N. J., Del., Ind., Iowa, Md., N. Y.; 25th, Idaho; 26th, Neb., Cal., Tex., Ohio, Mich., Kan., Ind., Tex.; 27th, Tex., La., Miss., Ala., Mo., Mich., Ohio, N. Y., Pa., Ark., Fla., Ill., Ind., Kan., Mass., N. C., Tenn.; 28th, Utah, Fla., Tenn., Ga., S. C., N. C., Va., Md., Me., Ind., Mass., Mo., Pa.; 29th, Ind. T., Ill., Kan., Mo., Tex., W. Va.; 30th, Ala., Fla., Tenn., Ohio, Ky., Ind. T., Ga., La., Md., Tex., W. Va.; 31st, Tex., Miss., W. Va., Pa., Fla., Ga., La., Ohio, Va.

*Auroras.*—Pembina, Dak., 3rd and 23rd; Newbury, Vt., 29th; Kensico, N. Y., 17th; Starkey, N. Y., 5th; Coalville, Utah, 3rd; Judsonia, Ark., 8th; Vevay, Ind., 20th; Cresco, Ia., 27th; Iowa City, 1st, 12th, 23rd, 27th, 28th; Woodstock, Md., 6th, 21st, 22nd, 26th, 28th. On Pike's Peak the electricity was intense, and interfered with the working of wires on the 6th and 26th; North Platte, strong, 8th; Santa Fé, interfered with the working of telegraph lines north and south, 18th and 26th.

*Magnetic Phenomena.*—Prof. G. Hinrichs, Iowa City, Ia., reports the average diurnal magnetic range in declination as 6.6 minutes.

## OPTICAL PHENOMENA.

*Solar Halos.*—1st, Ill., Ind., Mich., N. Y., Ohio, Pa., Wis., Ga.; 2nd, Conn., Me., N. H., N. Y., Vt., Fla., Ga., R. I., N. C.; 3rd, Cal.; 4th, Ohio; 5th, Ill., Ind., Iowa, Kan., Mich., Wis., Ohio, Ga.; 6th, Ill., Ind., Iowa, Me., Md., Mass., Mich., N. H., N. Y., Va., N. M., R. I., Vt., Conn.; 7th, Del., Ill., Iowa, Ohio, Tex., Ga., N. C., R. I.; 8th, Ind., Ohio, Mich., Ga., S. C.; 9th, Ill., Ind., Ohio, Ky., Ga., Me.; 10th, Iowa, Ohio, N. M., Mich., Me.; 11th, Ill., Iowa, Me., Neb., Ohio, Wis., S. C., Vt., N. H.; 12th, Iowa, Ohio, Me.; 13th, Fla., S. C.; 14th, Ohio, Mich., Conn., N. C.; 15th, Iowa, Miss., Neb., N. Y., Pa., Cal., La., Mich., S. C.; 16th, Miss., Ohio, Cal., Tex., La., S. C., Ga.; 17th, Me., N. Y., Vt., Col., La., Fla., S. C.; 18th, Ohio, Col.; 19th, Cal., La.; 20th, Ill., Iowa, Miss., Wis., La.; 21st, Conn., Miss., N. H., N. Y., Ohio, Pa., S. C., N. C., R. I.; 22nd, Col., S. C.; 23rd, Conn., N. J., Ohio, Cal., R. I., Vt.; 24th, Conn., Ohio, S. C., Me.; 25th, Conn., N. M.; 26th, N. Y., Ohio, Cal.; 27th, Minn., Mich., Ohio, N. C.; 28th, Iowa, Mich.; 29th, Ill., Ind., Ohio, Ky.; 30th, N. Y., S. C., Ga., N. C., Va.; 31st, Cal., Iowa, N. H., N. Y., Vt.

*Mirage.*—Morristown, Dak., 31st; Olivet, Dak., 24th, 25th; New London, Conn., 21st.

## MISCELLANEOUS PHENOMENA.

*BOTANICAL.*—Alabama—in bloom, 17th, quince and dogwood; 11th, sloes and wild plums; 12th, buckeye; 20th, honeysuckle; 25th, may-apple; 24th, snowdrops; 20th to 30th, apple and pears; 21st, fish poison; 16th, peach, apricot and plum; in leaf, 10th, quince tree; 8th, poplar and tulip trees. California—Visalia, in bloom, 2nd, apple; 3rd, plum. Connecticut—in bloom, 16th, white maple; in leaf, 19th, sycamore and elm; 15th, willow; budding, 6th, flowers; 8th, spirea; 19th, cherry; 20th, apple and pear; 24th, tigerlilies and lilies of the valley sprouting. Arkansas—in bloom, 15th, red-bud trees; 6th, apricots; 18th, dogwood; 22nd, lilacs; 25th, sweet gum; 26th, buckeye; in leaf, 16th, black and red oak. Dakota—Olivet, 1st, grass and weeds sprouting; Pembina, 24th, willows in bloom, grass sprouting. Florida—in bloom, 7th, peaches; in leaf, 28th, trees generally. Georgia—in bloom, 7th, peach and plum; in leaf, 20th, forest trees. Illinois—in bloom, 20th to 24th, peach; 22nd, japan quince; 25th, violets; 27th, flowering almond; 28th, daffodils; 21st, cowslips; 7th, ash and elm; in leaf, 11th, gooseberry; budding, 8th, peonies, gooseberries, rose bush, lilac and crab-apple; sprouting, 6th, grass and rhubarb. Indiana—in bloom, 1st, daffodils; 12th and 19th, peach; 8th, pansies; 14th, violets; 12th, iris, lilac and hyacinth; 10th, spinach gathered; budding, 8th, peach. Iowa—in bloom 23rd, 26th and 31st, peach; 11th, maple and elm; 16th, liverwort, wild flowers and hazel brush; 21st, cottonwood and box elder; 14th, poplars; 18th, myrtle; 24th, june cherries; 31st, siberian crab-apple; in leaf 8th, plum; 31st, apple; budding, 9th, maple and lilac; sprouting, 8th, grass and leeks; 24th, wheat; 31st, grass sufficient for pasture. Indian Territory—Fort Sill, in bloom 5th, peach. Idaho Territory—Boise City, in bloom 20th, plum and cherry; 22nd, peach. Kansas—in bloom, 9th, 11th, 19th to 21st, peach; 25th, wild plum and judas tree; 16th, tulips and ivy; 13th, maples; 15th, violets; 20th, plums; 26th, red bush; 27th and 30th, apples; in leaf, 5th raspberries; 14th, lilacs; 23rd, apples; 31st, pear, peach and forest trees; 22nd, crab-apple; 19th, rose and vine; budding, 6th, maples; sprouting, 31st, corn and oats; 14th, prairie grass. Louisiana—in bloom, 16th, orange trees. Maine—28th, mayflowers first gathered. Maryland—in bloom, 24th, peach; 14th, forsythia; 17th, plum; 24th, cherry; 7th, crocus and periwinkle; in leaf, 11th, weeping willow; budding, 8th, alder. Massachusetts—in bloom, 1st, skunk cabbage; 13th and 14th, crocus; 23rd, pansies; 10th, violets; in leaf, 23rd, lilac and syringa; budding, 12th, willow. Mississippi—in bloom, 1st, pitch pine; 5th, sweet-gum, evergreen, cherry, yellow woodbine and red maple; 6th, violets, spider-wort and whortleberry; 3d, post oak, red oak and plum; 8th, dewberry, red woodbine, sassafras and judas tree; 10th, flag-lilly; 12th, papaw; 13th, spirea, flowering almond and verbena; 16th,